

PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Donald R. Huffman et al. Examiner: P. DiMauro

Serial No.: 08/236,933

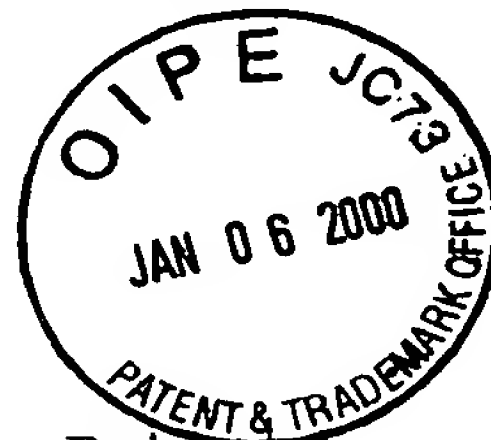
Art Unit: 1103

Filed: May 2, 1994

Docket: 7913zazy

For: NEW FORM OF CARBON

Assistant Commissioner for Patents  
Washington, DC 20231



RECEIVED  
TO 1100 MAIL ROOM

SUPPLEMENTAL DECLARATION OF WOLFGANG KRÄTSCHMER UNDER  
37 C.F.R. §1.132

I, WOLFGANG KRÄTSCHMER, declare and say as follows:

1. I am a co-inventor with Donald R. Huffman of the subject matter described and claimed in the above-identified application and in USSN 08/486,669.

2. This Declaration supplements the earlier Declaration I executed on September 10, 1997; it is not meant to replace it.

3. In the previous Declaration, I addressed the issue regarding the role of K. Fostiropoulous, a coauthor of the article entitled "The infrared and ultraviolet absorption spectra of laboratory produced carbon dust: evidence for the presence of the C<sub>60</sub> molecule in Chemical Physics Letters, 1990, 167-170 (hereinafter referred to as the "article"), respecting the subject matter described in the article and the above-identified specification.

4. In my Declaration, I explained at the relevant times, K. Fostiropoulous was a doctoral student conducting experiments in my research group in the laboratories at the

NOV 11 1999 13 01

DB\FI\WORK\030\7913zazy\m15c\7913zazy.d01

TO 1100 MAIL ROOM

Max-Planck Institute in Heidelberg, Germany towards completion of his doctorate from the University of Heidelberg in Germany.

5. I also explained in my Declaration that although K. Fostiropoulous was the person who performed experiments described in the article, the experiments described therein were conducted under my direction and control.

6. I therefore concluded in my previous Declaration that based on these facts, it is my opinion that K. Fostiropoulous is not an inventor of the claimed subject matter in the above-identified and is not an inventor of the subject matter in the article relating to this process of making fullerenes, including  $C_{60}$ .

7. I reiterate the comments therein and incorporate them by reference herein. This Supplemental Declaration is being submitted to amplify the facts in the earlier Declaration.

8. I have reviewed the claims currently pending in USSN 08/236,933 and 08/486,669.

9. It is my understanding that the United States Patent and Trademark Office has questioned some of the statements made in the aforementioned Declaration in view of commentary made by Jim Baggott, in a book entitled "Perfect Symmetry, The Accidental Discovery of Buckminsterfullerene", Oxford Laboratory Press, Oxford, NY 1994 ("Baggott").

10. It is also my understanding that the United States Patent and Trademark Office has referred to the passages

on Pages 138-139 and Page 150 of Baggott to support the allegation that Fostiropoulous may be more than a co-author and may be an inventor.

11. At the outset, it should be noted that Mr. Baggott was not present at the laboratories at the Max Planck Institute when the research described therein was taking place, but is reporting on the events as he interpreted them based on the information he obtained from various sources. As he states on Page 271 of Baggott:

I have put together my description of the events in Heidelberg and Tucson from December 1985-September 1990 from a combination of personal interviews with Krätschmer, Fostiropoulous, and Huffman, telephone conversations with Lamb, letters from Krätschmer and Fostiropoulous, and published accounts.

12. On the other hand, I was there and can report first hand on the events that took place at the relevant times.

13. Moreover, it is important to place the events described in the referred to passages in Baggott in the proper perspective.

14. The passage on Pages 138-139 of Baggott referred to by the United States Patent and Trademark Office relates to the preparation of carbon soot utilizing  $^{13}\text{C}$  graphite rods.

15. Prior to Dr. Fostiropoulous' participation in the fullerene project, Dr. Huffman and myself had previously vaporized graphite rods in the presence of an inert quenching gas, such as argon or helium in the bell jar evaporator apparatus as described in the application and in the article.

In addition, we had collected the soot and characterized the soot via UV absorption. We noted three specific absorptions at about 220, 270 and 340 nm in the UV; since the absorption spectra between 220 and 270 nm reminded us of camel humps, we designated the spectra between 220 and 270 as camel humps absorptions. (These three absorptions turned out to be associated with and reflective of the presence of  $C_{60}$  and  $C_{70}$ , resulting in the observed absorptions). At the time, these absorptions could not definitely be explained by us. Dr. Huffman attributed the absorption to the presence of  $C_{60}$  in the soot; however, it was my opinion that we had not eliminated the possibility that the lines in the UV were attributable to artifacts.

16. Therefore, to address this issue, we decided to repeat the experiment and vaporize the soot using graphite rods made from  $^{13}C$ . It is this experiment which is described in the cited Kratschmer, et al. article.

17. It was at this stage that Dr. Fostiropoulous joined our group.

18. Although  $^{13}C$  carbon powder exists,  $^{13}C$  carbon rods were not commercially available. Thus, the problem was making the  $^{13}C$  carbon rods to be used in place of the graphite rods in the process described in Paragraph 15 hereinabove.

19. Dr. Fostiropoulous and myself developed the apparatus described in the article to compress the carbon-13 powder into carbon-13 graphite rods. Baggott purports to

discuss the efforts utilized to find a means of compressing the carbon-13 powder into carbon-13 rods on Pages 138-139 of his book. These passages are therefore irrelevant to the process of preparing and isolating fullerenes, including  $C_{60}$ , as described in the above-identified application.

20. These  $^{13}C$  graphite rods were then used in the bell jar carbon evaporator earlier utilized by myself and Dr. Huffman to produce soot containing  $^{13}C$  in the presence of argon and helium, in accordance with the process described in Paragraph 15 hereinabove.

21. As described in the article, the experiment verified that the camel humps were not attributable to artifacts, but was a product resulting from the vaporization of the graphite under the conditions of the process developed by Dr. Huffman and myself in the bell jar carbon evaporator.

22. Thus, the experiments described in the article relating to the use of the carbon-13 rods and the preparation of soot comprised of carbon-13 were designed to verify that the soot produced in accordance with the process described in Paragraph 15 hereinabove contained  $C_{60}$ . Thus, these experiments were utilized for diagnostic purposes, i.e., verifying that the camel humps were attributable to  $C_{60}$ .

23. The information in Paragraphs 16-22 does not relate to the development of a process for preparing fullerenes, including  $C_{60}$ .

24. It should be noted that the Kratschmer, et al. article does not describe the separation and isolation of the  $C_{60}$  from the sooty carbon product, which, as I have been advised, is also acknowledged in the Office Action.

25. However, I understand that the United States Patent and Trademark Office refers to the passages on Page 150 of the Baggott article, which purports to describe the events leading to the separation and isolation of  $C_{60}$  from the soot.

26. The first  $C_{60}$  samples separated and isolated from the carbon soot prepared in accordance with the procedure in Paragraph 15 was by sublimation; and by extraction with benzene.

27. Although it is true that Dr. Fostiropoulous sublimed the  $C_{60}$  from the soot and although he was the person who first extracted the  $C_{60}$  from the soot with benzene, he conducted those experiments under my supervision and control.

28. Dr. Fostiropoulous did not develop nor propose the various steps involved in the preparation of fullerenes, e.g.,  $C_{60}$ , as outlined in the article or described in the above-identified specification.

29. More specifically, the process for preparing soot containing fullerenes, including  $C_{60}$ , as described in the above-identified specification was developed by Dr. Huffman and myself prior to his association with my research group, and was thus not developed by Dr. Fostiropoulous.

30. Moreover, the method for the isolation of the fullerenes, including  $C_{60}$ , from the soot was not suggested by Dr. Fostiropoulous.

31. Thus, based upon these facts, Dr. Fostiropoulous did not devise a method for preparing and isolating fullerenes, including  $C_{60}$ , as described and claimed in the above-identified application or in USSN 08/486,669. It is my opinion, therefore, that Fostiropoulous is not an "inventor", as that term is used in ordinary parlance, of the subject matter described and claimed in USSN 08/236,933 and 08/486,669.

32. Moreover, it is my opinion that Dr. Fostiropoulous is not an inventor, as that term is used in the ordinary parlance, of the subject matter described in the article, to the extent that it relates to the process for preparing fullerenes, including  $C_{60}$ , as described in Paragraph 15 and in the above-identified specification.

33. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

DATE

Nov. 3, 1999W. Krätschmer  
WOLFGANG KRÄTSCHMER